

SCAT
FY 2005 Program
Scope of Work for Traffic Signal System Optimization

Phase 1. Data Collection - Data Collection shall include the following items of work to be used in analysis, implementation and evaluation.

- I. The I.D.O.T. will provide (by districts):
 - A. Existing traffic signal plans, intersection geometrics and dimensions.
 - B. Existing sequence of operation.
 - C. Posted speed limits.
 - D. Existing traffic signal control equipment.
 - E. Minimum intersection phase timing parameters.
 - F. Existing programs (systems).
 - G. Formats for data conversion.
 - H. Existing data for closed loop systems.
 - I. Software for closed loop system.
 - J. Accident data for individual intersections.
 - K. Traffic signal Operation Manuals.

- II. The Consultant shall provide:
 - A. Manual traffic counts all movements, in clear weather and dry pavement conditions, will be totaled by 15-minute intervals for the following hours:
 - 12 Hours*
 - 6:00 AM to 6:00 PM
 - *(Tuesday, Wednesday, or Thursday)
 - B. Field data for an Intersection Delay Study for existing signal timing and phasing.
 - C. Field data for a Percent Stopping Study for existing signal timing and phasing.
 - D. Field data for determining travel time and delays of the existing signal system timing.
 - E. Determine/verify distance between intersections.
 - F. 24-hour, 7 day continuous tube counts, tabulated hourly.

Phase 2 - Data Analysis

- III. Using data collected for each intersection in Section II.A, though the use of the HCS computer program, a capacity analysis will be completed for AM, Midday and PM peak hours to determine optimum signal timing and phasing.
- IV. Using data obtained in Section II.B and II.C above, the following items will be calculated for each signal in the system for existing signal timing and phasing.
 - A. Motor vehicle operating costs.
 - B. Travel time required.
 - C. Fuel consumption.
 - D. Carbon monoxide emissions.
 - E. Hydrocarbon (HC) emissions.
 - F. Nitrogen oxides emissions.
- V. Using data collected in Section IV.D above, show existing travel time and delay for existing signal system timing and phasing will be determined.
- VI. Using data obtained in Section II.E and analysis obtained in Section III, and through use of PASSER II-90 version 1.0 or 2.0 computer software or Synchro software, a new signal progression for system to optimize traffic flow will be developed.

Phase 3 - Implementation

- VII. Using information developed in Section III and VI, the consultant will determine changes and/or modification needed to change each intersection timing and phasing and signal system progression to obtain optimum traffic flow during peak and off-peak hours and in conjunction with the District, make the necessary changes in the field. Observe new timing and fine tune as necessary.

Phase 4 - Evaluation

- VIII. Following implementation of recommendations of Section VII above, the following new data collected will be completed:
 - A. New field data for an Intersection Delay Study & Percent Stopping Study will be collected for the new signal timing and phasing of each intersection.
 - B. New travel time and delay runs will be conducted for the revised

signal system progression.

- IX. Using the information collected in Sections VIII.A and VIII.B above, the following will be determined for each intersection:
 - A. Reduction in vehicle operating costs.
 - B. Reduction in travel time.
 - C. Reduction in fuel consumption.
 - D. Reduction in carbon monoxide emissions.
 - E. Reduction in hydrocarbon (HC) emissions.
 - F. Reduction in nitrogen oxide emissions.
- X. New travel time and delay diagrams will be developed to show reduction in travel time and delays of the retimed signal system.
- XI. Report summarizing final findings.
- XII. All data used in the following analysis and copy of computer data base developed will be given to Department.

Progress Reports will include a statement summarizing the work performed during the report period and an outline of the work expected to be performed during the following period.